

NASA Success Story

Improved Portable Ultrasonic Leak Detector



UE Systems, Inc. is successfully commercializing an ultrasonic leak detector module based on a technology developed at Kennedy Space Center to fix hard-to-find hazardous fluid leaks in Space Shuttle launch and ground support equipment. The Elmsford, New York company is offering the LRM-2 Long Range Module, a plug-in module for the firm's existing product called the Ultraprobe(tm). The module uses a parabolic collecting horn to enhance leak detection from a distance. The horn is reliable, sensitive, and increases versatility while it discriminates against background noise. The parabolic design of the amplifying chamber reflects all signals directly to the transducer with minimal acoustic energy loss. The signal from the transducer is pre-amplified and transferred to the Ultraprobe housing where it is amplified again. This "double amplification" effect works acoustically like a telescope and magnifies the leak for easier detection. The Ultraprobe had an established customer base and by creating a simple plug-in module, UE Systems was able to get it to the widest possible market.

NASA Involvement The long-range leak detector improvements were started during the summer of 1991 when the entire Space Shuttle fleet was grounded due to leak problems in the main engine compartments. KSC engineers developed new ultrasonic leak detectors to find leaks in the aft compartments. The off-the-shelf detectors did not provide long-range sensitivity and reliability as well as other fabricated devices. Further improvements were made resulting in innovative circuitry, improved transducers and collecting horns to provide a high degree of reliability and sensitivity.

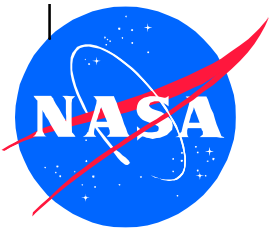
Social/Economic Benefit Instead of producing an entirely new instrument, UE Systems utilized NASA's sensor design to create a plug-in module for an existing product line. The LRM-2 was developed to significantly increase the distance from which a leak can be detected. The user can remain safely on the ground while scanning overhead lines and other inaccessible areas for leaks that might otherwise go undetected. One of the most common plant applications is to detect leaks

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Improved Portable Ultrasonic Leak Detector (Continued)

in pressure and vacuum systems, such as pipelines, underground utilities, air-conditioning systems, power transmission lines, and pressurized overhead telephone cables. NASA and the military are using the new detectors to find leaks on flight hardware and in fuel tank tests, as well as ground support equipment for future Shuttle missions. Boeing, in Huntsville, AL, is also considering using the product on the Space Station. The opportunity is available for saving American manufacturers money by providing increased energy conservation. In some factories in the U.S. there is a waste of energy associated with compressed air systems. Using the LRM-2 to detect possible air leaks could save companies thousands of dollars.

Industry Partner

UE Systems Inc.

NASA Partner

Kennedy Space Center

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